IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of
RICHARDSON et al.
Serial No. 10/811,309
Filed: March 29, 2004

Conf. No.: 8273
Atty. Ref.: JAR-3691-666
TC/A.U.: 1791
Examiner: J. LAZORCIK

For: METHOD OF MAKING COATED GLASS ARTICLE, AND INTERMEDIATE PRODUCT USED IN SAME

* *

July 14, 2010

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Appellant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner.

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(I) REAL PARTY IN INTEREST

The real party in interest is Guardian Industries Corp., a corporation of the country of the United States of America.

(II) RELATED APPEALS AND INTERFERENCES

An Appeal Brief was filed in connection with Application Serial No. 10/960,289. The instant application and the '289 application may arguably be viewed as including somewhat related subject matter.

The appellant, the undersigned, and the assignee are not aware of any other related appeals, interferences, or judicial proceedings (past or present), which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

(III) STATUS OF CLAIMS

Claims 1-7, 12-18, and 21-23 are pending and have been rejected. Claims 8-11 and 19-20 previously were cancelled. No claims have been substantively allowed. The rejection of claims 1-7, 12-18, and 21-23 is being appealed.

(IV) STATUS OF AMENDMENTS

No amendments have been filed since the date of the Final Rejection.

(V) SUMMARY OF CLAIMED SUBJECT MATTER

This Section is for purposes of example only and is not limiting as to the scope of the claims that are pending.

Claim 1 relates to a method of making an insulating glass (IG) window unit (e.g., Fig. 3 flowchart; paragraph 38). A multi-layered low-E coating is sputtered onto a glass substrate (e.g., step 1 in Fig. 3; paragraphs 35, 38, and 46-47), wherein the low-E coating comprises at least one infrared (IR) reflecting layer comprising silver sandwiched between at least first and second dielectric layers (e.g., 23 in Fig. 2, 23' in Fig. 5; paragraphs 35, 38, and 46-47). A flexible protective sheet in non-liquid form is adhered to a top surface of the low-E coating via an adhesive layer to form a protected coated article (e.g., step 2 in Fig. 3; paragraphs 36-38), wherein said flexible protective sheet is 1 mil to 3 mils in thickness, and wherein said flexible protective sheet is not water-soluble (e.g., 27 in Fig. 2; paragraphs 36-38). Following adhering of the protective sheet to the top surface of the low-E coating, the protected coated article is shipped to a fabricator of IG window units (e.g., 4 in Fig. 3; paragraph 39), with the fabricator cutting the protected coated article into an appropriate shape and size with the protective sheet thereon (e.g., 6 in Fig. 3; paragraph 40), edge seaming the protected coated article with the protective sheet thereon (e.g., 9 in Fig. 3; paragraph 40), and washing the protected coated article with the protective sheet thereon (e.g., 11 in Fig. 3; paragraph 40), so that following the cutting, edge seaming and washing the protective sheet remains adhered to the top surface of the low-E coating via the adhesive layer. Following said cutting, edge seaming and washing, the protective sheet is peeled off of the top surface of the low-E coating to

form an unprotected coated article (e.g., 14 in Fig. 3; paragraphs 41-43). After peeling the protective sheet off of the top surface of the low-E coating, the unprotected coated article is inserted into a furnace and thermally tempering the unprotected coated article including the glass substrate and low-E coating in the furnace (e.g., 15 in Fig. 3; paragraphs 41-43). After said tempering, the tempered coated article including the glass substrate and low-E coating is coupled (e.g., 17 in Fig. 3; paragraph 44) to another glass substrate to form an IG window unit (e.g., IG window unit in Fig. 4; paragraph 44).

Claim 12 relates to a method of making a window unit (e.g., Fig. 3 flowchart; paragraph 38). A multi-layered low-E coating is sputtered onto a glass substrate (e.g., step 1 in Fig. 3; paragraphs 35, 38, and 46-47), wherein the low-E coating comprises at least one infrared (IR) reflecting layer sandwiched between at least first and second dielectric layers (e.g., 23 in Fig. 2, 23' in Fig. 5; paragraphs 35, 38, and 46-47). A protective sheet in non-liquid form is adhered to a top surface of the low-E coating via an adhesive layer to form a protected coated article (e.g., step 2 in Fig. 3; paragraphs 36-38), wherein said flexible protective sheet is 1 mil to 3 mils in thickness, and wherein said protective sheet is not water-soluble (e.g., 27 in Fig. 2; paragraphs 36-38). Following adhering of the protective sheet to the top surface of the low-E coating, the protected coated article is cut into at least one shape and size with the protective sheet thereon (e.g., 6 in Fig. 3; paragraph 40), and thereafter the protected coated article is washed with the protective sheet thereon (e.g., 11 in Fig. 3; paragraph 40), so that following the cutting and washing the protective sheet remains adhered to the top surface of the low-E coating. Following said cutting and washing, the protective sheet is peeled off of the top surface

of the low-E coating to form an unprotected coated article (e.g., 14 in Fig. 3; paragraphs 41-43). After peeling the protective sheet off of the top surface of the low-E coating, the unprotected coated article is inserted into a furnace and heat treating the unprotected coated article including the glass substrate and low-E coating in the furnace (e.g., 15 in Fig. 3; paragraphs 41-43). After said tempering, the tempered coated article is used in making a window unit (e.g., IG window unit in Fig. 4; paragraph 44).

In addition to the features of claim 1, **claim 21** further specifies that said step of adhering the flexible protective sheet in non-liquid form to the top surface of the low-E coating comprises applying the flexible protective coating to the surface when the surface is at a temperature of about 60-120 degrees C (e.g., step 2 in Fig. 3; paragraphs 36-38).

In addition to the features of claim 1, **claim 22** further specifies that said step of adhering the flexible protective sheet in non-liquid form to the top surface of the low-E coating comprises applying the flexible protective coating to the surface when the surface is at a temperature of from about 90-120 degrees C (e.g., step 2 in Fig. 3; paragraphs 36-38).

In addition to the features of claim 1, **claim 23** further specifies that said flexible protective sheet applied in non-liquid form to a top surface of the low-E coating is applied in solid sheet and/or tape form and thus requires no curing (e.g., 27 in Fig. 2; paragraphs 36-38).

(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-7, 12-18, and 21-23 are unpatentable over Stachowiak (U.S. Patent No. 6,602,608) in view of Medwick (U.S. Patent No. 6,682,773) and Konda (U.S. Patent No. 5,254,201) under 35 U.S.C. § 103(a).

(VII) ARGUMENT

The USPTO has the burden under 35 U.S.C. § 103 of establishing a *prima facie* case of obviousness. *In re Piasecki*, 745, F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). It can satisfy this burden only by showing that some objective teaching in the prior art, or that knowledge generally available to one of ordinary skill in the art, would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). The Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006); *see also* KSR v. Teleflex, 127 S. Ct. 1727, 1741 (2007) (quoting Federal Circuit statement with approval). Even assuming, *arguendo*, that a given combination of references is proper, the combination of references must in any event disclose the features of the claimed invention in order to render it obvious.

Claims 1-7, 12-18, and 21-23 stand rejected under 35 U.S.C. § 103(a) as allegedly beign unpatentable over Stachowiak (U.S. Patent No. 6,602,608) in view of Medwick (U.S. Patent No. 6,682,773) and Konda (U.S. Patent No. 5,254,201). This rejection is erroneous and should be reversed for at least the following reasons.

Certain example embodiments relate to a temporary protective polymer based layer that is formed on a coated glass substrate to protect the low-E coating thereof during transport, cutting, edge seaming, washing and handling prior to heat treatment (e.g., thermal tempering). In certain example embodiments, the temporary protective

coating is designed such that it can be applied over a low-E coating in an efficient manner without the need for any sort of lengthy curing procedure (e.g., without the need for convective air drying, radiant heat drying, convective heat drying, heat drying, vacuum drying, and/or radiation curing such as UV, IR or RF curing). In this regard, the temporary protective coating is preferably applied in solid sheet and/or tape form (i.e., as opposed to liquid form) so that no true curing is needed. For example, the temporary protective coating can be easily applied via lamination or the like in an efficient and reasonable manner and, typically, the temporary protective layer is easily removed by peeling it off prior to heat treatment.

As explained in the specification at paragraph 31, it has been found that the use of the protective layer discussed in the instant application allows yields to be improved by at least 50%, and also allows significant post-HT defects to be reduced by at least 50%, more preferably by at least 75% (e.g., compared to a situation where merely Lucor spacer powder is used).

Moreover, as explained in the specification at paragraph 32, it surprisingly and unexpectedly has been found that the protective layer provides added durability/ protection even after it has been removed. It is believed that this may be due to residual material from the adhesive layer which may remain on the coating following peeling off of the protective layer. This residual material from the adhesive layer, left on the coating for durability purposes after removal of the protective layer and most of the adhesive layer, is then burned off during heat treatment so that it does not create optical problems or the like. This residual added durability/protection is highly advantageous in

processing/handling which occurs between the time of protective layer removal and heat treatment. This unexpected result represents a significant advantage in the art.

At the outset, Applicant respectfully submits that the outstanding rejection relies on an improper hindsight reconstruction of the pending claims. Stachowiak, the base reference in this three-way § 103 rejection, contains no motivation to modify its glass substrate based on Medwick's protective coating. However, even the (improper) alleged combination fails to meet all the features of claim 1. For example, neither reference teaches or even remotely suggests adhering a flexible protective sheet via an adhesive layer to form a protected coated article, as acknowledged in the Final Office Action, or that *following* said cutting, edge seaming and washing, *peeling* the protective sheet off of the top of the surface of the low-E coating to form an unprotected coated article.

Citation to Konda does not cure these fundamental deficiencies. First, one skilled in the art would not modify the Stachowiak/Medwick combination based on Konda because Medwick teaches directly away from peelable protective sheets:

> [T]he solid peeled film must be properly disposed of. Further, considerable time is required to peel the coating completely off of the substrate surface. For hastily removed peelable coatings, small pateches of the peelable coating may remain on the substrate, requiring increased time and labor costs to inspect and remove these small patches (col. 2, lines 21-27 of Medwick).

In addition to teaching directly away from modification based on Konda, Medwick's and Konda's "substrates" are vastly different in size and in application. Therefore, deposition techniques and removal techniques of the protective coating/sheet of each reference are not necessarily interchangeable with and/or applicable to the other. Although Konda does involve a peelable sheet of sorts, it is designed to cover a significantly smaller surface area than Medwick in the context of a significantly different

product. For instance, Medwick explains that in the glass industry, large glass pieces, e.g., generally greater than about four feet by six feet, are prepared by glass manufacturers and then shipped to fabricators to be cut into smaller pieces. *See, e.g.*, col. 1, lines 40-43 of Medwick. Konda, on the other hand, discloses a "substrate" that is a semiconductor wafer having a diameter of four inches. *See, e.g.*, col. 4, line 35 of Konda.

There is no indication in Konda that it could be used for a significantly larger-scale operation. There is also no indication that if Konda's protective sheet *were* used, it would not face the same problems as disclosed in Medwick. Medwick advises against and therefore teaches away from peelable coatings. Konda does not disclose or suggest a coating that is capable of use on a large substrate. Konda's protective sheet, by virtue of its incredibly small size (16 square inches), would not be subject to the same problems disclosed by Medwick with respect to peelable coatings for much larger substrates (24 square feet). Therefore, modification of the Stachowiak/Medwick combination in view of Konda would be directly contrary to the teachings of Medwick. Moreover, according to Medwick, such modification would result in a coating that is difficult to remove.

<u>Simply stated, one skilled in the art would have no reasonable expectation of success in applying teachings relating to a peelable coating for 16 square inches worth of semiconductor material when designing a peelable coating for a 24 square foot glass substrate</u> -- at least in view of the problems with peelable coatings discussed in Medwick.

In addition to the fact that one skilled in the art would recognize that the further introduction of Konda's teachings to the (already-improper) Stachowiak/Medwick combination would simply would not work and thus have no reasonable expectation of success in making such a further modification, Applicant respectfully disagrees with the

Final Office Action's contention that Konda constitutes analogous art to Medwick because "the disclosed film is applied to a substrate in such a manner to protect the fine structure of a film formed thereon from damage or marring." Again, Konda's protective sheet is designed to cover a semiconductor wafer with a four inch diameter. Medwick's protective coating is designed to protect large (24 square feet) sheets of glass. Application and removal of these respective protective coatings will vary greatly at least because of the significant difference in substrate size and substrate compositions and coatings thereon. Despite the fact that both references arguably disclose some sort of protective coating, the logistics of getting the coatings on and off, as well as way each coating functions, are very dissimilar -- to say nothing of the underlying substrates themselves. Thus, these coatings would not have even been eligible for combination by one skilled in the art. Teachings concerning a 16 square inch coating for the semiconductor industry that is specifically known to <u>not</u> scale well and present removal <u>problems</u> certainly would not have logically commended itself to an inventor's attention when attempting to protect a 24 square foot glass sheet for which easy coating removal is desirable. Any allegation to the contrary constitutes the improper use of hindsight.

Moreover, even in improper combination, the three-way combination of Stachowiak, Medwick and Konda still fails to meet all the features of claim 1. The protective sheet of claim 1 is removed subsequent to washing ("following said cutting, edge seaming and washing, peeling the protective sheet off of the top surface of the low-E coating to form an unprotected coated article"). Medwick does not disclose this subject matter, and Konda *cannot* disclose this. Medwick's coating is washed off during the aqueous washing stage, and because Konda is directed to a protective film for a

semiconductor wafer, it is inapposite and unrelated to protecting a substrate until after washing it. This feature of the method is not accomplished/performed by any of the methods described in the applied prior art references. Even the alleged combination is deficient in this regard because the alleged combination would lack the claimed post-wash peeling.

Of course, the numerous advantages identified above do not naturally flow from the (improper) three-way combination of references. And the surprising and unexpected results discussed above further rebut any alleged case of obviousness.

In sum, Applicants respectfully submit that all claims are patentably distinct from the applied prior art references. (1) Medwick teaches directly away from peelable protective sheets; (2) Konda does not contain a teaching or suggestion regarding how its protective sheet could be used on a large scale, and thus, even if Konda's protective sheet were implemented in Stachowiak/Medwick, it would face the same problems taught by Medwick regarding peelable coatings, due to the large size of the glass substrates requiring these protective coatings/sheets; and (3) even if Stachowiak/Medwick were (incorrectly) modified based on Konda, no applied prior art reference discloses *following said washing*, peeling the protective sheet off. The rejection of claim 1 and its dependents are improper for at least these reasons.

The alleged three-way combination of Stachowiak, Medwick, and Konda is similarly improper for claim 12. In addition, claim 12 recites features similar to those discussed above in connection with claim 1. Thus, Applicant respectfully submits that claim 12 and its dependents should be allowable for substantially the same reasons as those presented above.

Claims 21-23 should be allowable over the cited art for yet further reasons. For instance, there does not appear to be any detail at all regarding rejection of claim 23. Thus, this rejection is facially improper.

In addition, claims 21-22 further specify that the flexible protective coating is applied to the surface when the surface is at specific temperature ranges. The Final Office Action concedes that these ranges are not taught or suggested in the cited references at all but curiously indicates "that the claimed temperature ranges are insufficient to patentably distinguish the claimed invention over that set forth in the collective prior art." But Applicant is aware of no case law or MPEP section that permits claim language to be wholly ignored in this manner. Quite the contrary, the MPEP indicates that all claim limitations must be considered. The temperature ranges at which the flexible protective sheets are to be applied are positive recitations that cannot be ignored -- particularly in the context of a method claim.

The Final Office Action also misapprehends and misrepresents the teachings of Applicant's specification at paragraph 38. The description in paragraph 38 does not concede that the application of the protective sheet at particular temperatures would have been obvious. Quite the contrary, this paragraph indicates that the application to the protective sheet at particular temperatures are particularly advantageous because such application would mesh well with the overall process flow. This advantage plainly is not taught in the cited references, and the fact that Applicant recognized this advantage and developed a flexible protective sheet that takes into account the overall process flow actually evidences the patentable nature of these claims.

The remainder of the rejection of claims 21-22 is based on pure unsupported hindsight. The Final Office Action concedes that there is no evidence of record regarding substrate temperature ranges. As a result, there is no evidence of record to support the conclusion that the claimed temperature ranges are outcome effective variables. But the case law is clear that without this underlying showing, the claimed temperature ranges would not have been subject to routine optimization/experimentation. This entire line of "reasoning" in the Final Office Action is wholly unsupported, conclusory, and admittedly based on Applicant's own specification (albeit a misreading thereof) rather than any teachings or suggestions in the cited art. The rejections of claims 21-22 are flawed for these further reasons.

In view of the foregoing, Applicant respectfully requests that the § 103 rejection of all claims be reversed.

CONCLUSION

In conclusion it is believed that the application is in clear condition for allowance; therefore, early reversal of the Final Rejection and passage of the subject application to issue are earnestly solicited.

Respectfully submitted,

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(VIII) CLAIMS APPENDIX

1. A method of making an insulating glass (IG) window unit, the method comprising:

sputtering a multi-layered low-E coating onto a glass substrate, wherein the low-E coating comprises at least one infrared (IR) reflecting layer comprising silver sandwiched between at least first and second dielectric layers;

adhering a flexible protective sheet in non-liquid form to a top surface of the low-E coating via an adhesive layer to form a protected coated article, wherein said flexible protective sheet is 1 mil to 3 mils in thickness, and wherein said flexible protective sheet is not water-soluble;

following adhering of the protective sheet to the top surface of the low-E coating, shipping the protected coated article to a fabricator of IG window units;

the fabricator cutting the protected coated article into an appropriate shape and size with the protective sheet thereon, edge seaming the protected coated article with the protective sheet thereon, and washing the protected coated article with the protective sheet thereon, so that following the cutting, edge seaming and washing the protective sheet remains adhered to the top surface of the low-E coating via the adhesive layer;

following said cutting, edge seaming and washing, peeling the protective sheet off of the top surface of the low-E coating to form an unprotected coated article;

after peeling the protective sheet off of the top surface of the low-E coating, inserting the unprotected coated article into a furnace and thermally tempering the

unprotected coated article including the glass substrate and low-E coating in the furnace; and

after said tempering, coupling the tempered coated article including the glass substrate and low-E coating to another glass substrate to form an IG window unit.

2. The method of claim 1, wherein an uppermost layer of the low-E coating comprises silicon nitride, wherein the protective sheet is adhered to the layer comprising silicon nitride via the adhesive layer.

3. The method of claim 1, wherein the adhesive layer comprises acrylic.

4. The method of claim 1, wherein the protective sheet comprises polyethylene.

5. The method of claim 1, wherein the protective sheet has a visible transmission of less than 70%.

6. The method of claim 1, wherein the IG window unit has a visible transmission of from 60 to 75%.

7. The method of claim 1, wherein the protective sheet is blue and/or green colored.

12. A method of making a window unit, the method comprising:

sputtering a multi-layered low-E coating onto a glass substrate, wherein the low-E coating comprises at least one infrared (IR) reflecting layer sandwiched between at least first and second dielectric layers;

adhering a protective sheet in non-liquid form to a top surface of the low-E coating via an adhesive layer to form a protected coated article, wherein said flexible protective sheet is 1 mil to 3 mils in thickness, and wherein said protective sheet is not water-soluble;

following adhering of the protective sheet to the top surface of the low-E coating, cutting the protected coated article into at least one shape and size with the protective sheet thereon, and thereafter washing the protected coated article with the protective sheet thereon, so that following the cutting and washing the protective sheet remains adhered to the top surface of the low-E coating;

following said cutting and washing, peeling the protective sheet off of the top surface of the low-E coating to form an unprotected coated article;

after peeling the protective sheet off of the top surface of the low-E coating, inserting the unprotected coated article into a furnace and heat treating the unprotected coated article including the glass substrate and low-E coating in the furnace; and

after said tempering, using the tempered coated article in making a window unit.

13. The method of claim 12, wherein an uppermost layer of the low-E coating comprises silicon nitride, wherein the protective sheet is adhered to <u>a</u> layer comprising silicon nitride via the adhesive layer.

14. The method of claim 12, wherein the adhesive layer comprises acrylic.

15. The method of claim 12, wherein the protective sheet comprises polyethylene.

16. The method of claim 12, wherein the protective sheet has a visible transmission of less than 70%.

17. The method of claim 12, wherein the window unit has a visible transmission of from 60 to 75%.

18. The method of claim 12, wherein the protective sheet is blue and/or green colored.

21. The method of claim 1, wherein said step of adhering the flexible protective sheet in non-liquid form to the top surface of the low-E coating comprises applying the flexible protective coating to the surface when the surface is at a temperature of about 60-120 degrees C.

22. The method of claim 1, wherein said step of adhering the flexible protective sheet in non-liquid form to the top surface of the low-E coating comprises applying the flexible protective coating to the surface when the surface is at a temperature of from about 90-120 degrees C.

23. The method of claim 1, wherein said flexible protective sheet applied in non-liquid form to a top surface of the low-E coating is applied in solid sheet and/or tape form and thus requires no curing.

(IX) EVIDENCE APPENDIX

None.

(X) RELATED PROCEEDINGS APPENDIX

As indicated above, an Appeal Brief was filed in connection with Application Serial No. 10/960,289, and the instant application and the '289 application may arguably be viewed as including somewhat related subject matter. Accordingly, a copy of the Appeal Brief filed in the '289 application is attached hereto.